



**Intelligent Transport Systems (ITS);
Testing;
Part 4: Conformance test specification for
GeoNetworking Basic Transport Protocol (BTP);
GeoNetworking BTP validation report**

Reference

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Keywords

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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Intelligent Transport System (ITS).

The present document is part 4 of a multi-part deliverable. Full details of the entire series can be found in part 1 [i.2].

Introduction

In response to EC mandate M/453, ETSI Technical Committee ITS has standardized base and test specifications for ITS protocols. In a next step a prototype TTCN-3 test system was built and validated. The present document and its related TR 103 099 [i.1] (Architecture of Conformance Validation Framework), describe the validation and design of the prototype TTCN-3 test system.

The action described in the present document has supported the implementation of ITS standards by:

- Making available validated and standardized test specifications and thus enabling the application of reliable certification schemes.
- Executing conformance validation framework against real Implementations Under Test (IUTs) from industry and thus providing these companies a conformance assessment of their implementations. During the lifetime of this action, the conformance validation framework was as well provided at ITS Cooperative Mobility Services Interoperability events.
- Releasing all software as open source and thus allowing industry to build and run their own conformance validation framework.

1 Scope

The present document is the validation report of the BTP conformance tests and it provides statistics of executed and validated BTP conformance tests. The information provided has been produced by validation against two prototype implementations from industry.

Furthermore, identified base specifications and test specification issues are listed in the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

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2.1 Normative references

The following referenced documents are necessary for the application of the present document.

Not applicable.

2.1 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ETSI TR 103 099 (V1.1.1): "Intelligent Transport Systems (ITS); Architecture of conformance validation framework".
- [i.2] ETSI TR 103 061-1: "Intelligent Transport Systems (ITS); Testing; Part 1: Conformance test specification for Co-operative Awareness Messages (CAM); CAM validation report".
- [i.3] ETSI EG 201 015 (V1.1.1): "Methods for Testing and Specification (MTS); Specification of protocols and services; Validation methodology for standards using SDL; Handbook".

3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ASN	Abstract Syntax Notation
ATS	Abstract Test Suite
BTP	Basic Transport Protocol
BTP-A	BTP Class A
BTP-B	BTP Class A
CAM	Co-operative Awareness Message
DENM	Decentralized Environmental Notification Basic Service
EC	European Commission
ITS	Intelligent Transportation Systems
SUT	Implementation Under Test
TC	Test cases
TP	Test Purposes

TTCN Testing and Test Control Notation (TTCN-3)
TTCN-3 Testing and Test Control Notation 3

4 Validation Report

4.1 Validation level

Level 3 (Rigorous) abstract test suite validation has been performed, according to the validation handbook [i.3]:

- the test suite has been compiled on more than one TTCN-3 tool;
- the complete suite of tests has been implemented and executed on more than one test platform;
- the complete suite of tests have been executed against SUTs from a range of different suppliers;
- the operation and output traces of all the tests have been validated.

4.2 Source code evaluation

4.2.1 TTCN-3 version

The BTP abstract test suite is based on TTCN-3 edition 4.2.1 (TTCN3:2010).

4.2.2 TTCN-3 tools used for compilation

The test suite has been compiled using three different TTCN-3 tools, as detailed in table 1.

Table 1: TTCN-3 tools details

Supplier	Tool name	Version	Compilation result
TestingTech	TTworkbench	1.1.13	No error
Elvior	TestCast T3	6.3.1	No error
OpenTTCN	OpenTTCN Tester 2012	4.2.2	No error

4.3 Validation Process

4.3.1 Validation method

4.3.2 Test Platforms

The validation test platform has been built as described in the conformance validation framework [i.1] using the following components:

Table 2: Validation test platform components

TTCN-3 Tool	TestingTech TTworkbench v13 with ASN.1 support plugin
Test Adapter	<ul style="list-style-type: none"> • Software: Implemented by STF424. ITS Test Adapter v1.1.1 • G5 Radio hardware: Cohda Wireless™ MK2 connected via Ethernet cable
Codec	Implemented by STF424. ITS Codec v1.1.1

4.3.3 SUTs

The following SUTs have been used to validate the BTP test suite.

Table 3: SUTs used for validation

Manufacturer	Product name	Version
Hitachi™ Europe SAS	GeoNwt	2.1.0
NEC™ Europe LTD	GeoNwt	2.1.3

4.3.4 Validation Status

Table 4 shows the validation status of each test case of the BTP abstract test suite.

Table 4: Validated IUTs details

TC identifier	TC Summary	Validated	Comments
TC_BTP_PGA_BV_01	Checks that BTP-A packets is well-formatted	Yes	
TC_BTP_PGB_BV_01	Checks that BTP-B packets is well-formatted if Destination Port info is provided	Yes	
TC_BTP_PGB_BV_02	Checks that BTP-B packets are well-formatted if no Destination Port Info is provided	Yes	
TC_BTP_PP_BV_01	Checks that BTP passes a valid BTP-A packets to the upper protocol entity	Yes	
TC_BTP_PP_BV_02	Checks that BTP passes a valid BTP-B packets to the upper protocol entity	Yes	

4.4 Feedback to standardization process

4.4.1 Base standard issues

The following issue was reported by STF424 to the ETSI TC ITS WG3.

- BTP should define a well-known port number for CAM and DENM.

4.4.2 Test specification issues

No test specification issue was discovered during validation process.

4.4.3 Typical SUT issues

No SUT issue was discovered during validation process.

Annex A: Bibliography

ETSI TS 102 636-5-1 (V1.1.1): "Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 5: Transport Protocols; Sub-part 1: Basic Transport Protocol".

ETSI TS 102 870-1 (V1.1.1): "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for Geonetworking Basic Transport Protocol (BTP); Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) proforma".

ETSI TS 102 870-2 (V1.1.1): "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for Geonetworking Basic Transport Protocol (BTP); Part 2: Test Suite Structure and Test Purposes (TSS&TP)".

ETSI TS 102 870-3 (V1.1.1): "Intelligent Transport Systems (ITS); Testing; Conformance test specifications for Geonetworking Basic Transport Protocol (BTP); Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT)".

ETSI ES 201 873-1 (V4.3.1): "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".

ETSI EG 202 798 (V1.1.1): "Intelligent Transport Systems (ITS); Testing; Framework for conformance and interoperability testing".

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History

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